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Overcoming challenges of catastrophe modelling in data poor regions

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There is an increasing demand for loss accumulation tools in expanding international insurance markets such as India, China and Thailand. This reflects the combination of an increase in exposures in these territories as industry intensifies and urban development expands, as well as several notable natural catastrophes affecting these areas over the past few years (e.g. extreme floods in Mumbai in 2006 and in Thailand in 2011).

Large, global insurers and reinsurers are embracing the opportunity to underwrite these exposures but only where adequate tools are available to provide understanding of the hazards, exposures and potential losses. Unlike more developed countries, data availability in these regions is typically limited and of poor resolution, but model development is still required in order to analyse the risk. Some of the modelling challenges associated with data limitations include: (1) dealing with a lack of hydrological data which results in greater uncertainty of the flow rate and event frequency; (2) lower DTM resolution than that available across much of Europe, which underlies the hazard component of the catastrophe model; (3) limited accessibility to data that characterises the Built Environment including information on different building types and their susceptibility to damage; and (4) a lack of claims data from previous events or engineering research into the vulnerability of different building types. This is used to generate of country and structure specific vulnerability curves that explain the relationship between hazard intensity and damages.

By presenting an industry specific flood model for data-poor India in collaboration with Allianz Re, we illustrate how we have overcome many of these challenges to allow loss accumulations to be made. The resulting model was successfully validated against the floods in Mumbai and Surat in 2006 and is being developed further with the availability of new data.